

**Bull Trout Final Critical Habitat Justification: Rationale for Why Habitat is
Essential, and Documentation of Occupancy**

**Chapter 12. Mid-Columbia Recovery Unit—John Day River
Critical Habitat Unit**

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Chapter 12. John Day River Critical Habitat Unit

The John Day River CHU is essential for bull trout conservation because it is a large CHU, centrally located in the southern portion of the Mid-Columbia RU; has no major dams to prevent connectivity through existing FMO habitats within and among this and other CHUs via the Columbia River; and appears to contain both resident and fluvial life history strategies (see Appendix 1 for more detailed information).

The John Day River Basin CHU in the John Day River Basin in eastern Oregon includes portions of the mainstem John Day River, North Fork John Day River, Middle Fork John Day River and their tributary streams within Wheeler, Grant, and Umatilla Counties in Oregon. Four critical habitat subunits (CHSUs) are defined for the John Day River unit: Lower Mainstem John Day River, Upper Mainstem John Day River, North Fork John Day River, and Middle Fork John Day River. Bull trout in the John Day Basin exhibit both resident and fluvial life histories. The latter three generally correspond to core areas. A total of twelve local populations are found in this CHU. Research is needed to evaluate the status of the populations in this CHU. All critical habitat designations are essential to the long-term conservation of the species. The Confederated Tribes of the Warm Springs owns lands in this CHU.

Rationale for determining Critical Habitat based on the Seven Guiding Principles

1. *Conserve opportunity for diverse life-history expression* – The four CHSUs have no major dams preventing connectivity between populations, although mainstem habitats during the summer and fall can be inhospitable because of temperature and flow conditions. Access to the Columbia River would be possible during the winter and spring. Bull trout in the John Day Basin exhibit both resident and fluvial life histories. Tracking of radio-tagged fish has documented the fluvial life history (Hemmingsen, Gunkel, and Sankovich et al. 2001, pp. 9-11). Bull trout have been captured in the mainstem John Day River near the town of Spray radio tagged and then tracked to locations in the North Fork John Day River (Hemmingsen, Gunkel, and Sankovich et al. 2001, p. 9). In the upper John Day River fluvial fish have been observed as far downstream as the John Day visitor center at Sheep Rock (Service in litt. 2008f, p. 4) and in the lower Middle Fork John Day River near Ritter (ODFW, *in litt.*, 2003). The ability to migrate is important to the persistence of local bull trout subpopulations (Rieman and McIntyre 1993, p. 7; Gilpin 1997; Rieman and Clayton 1997, p. 11; Rieman et al. 1997, p. 54).

2. *Conserve opportunity for genetic diversity*- Genetic samples have been taken from streams in the three core areas that support local populations and analyzed. Bull trout from the John Day basin group with other populations in the “Inland” lineage (Spruell and Allendorf 1997, p. 1). Although there was little genetic variation within populations there was substantial variation between populations (Bellerud et al. 1997, p. 1; Spruel and Allendorf 1997, p. 13), hence the need to conserve all populations of bull trout to preserve genetic diversity of the species.

3. *Ensure bull trout are distributed across representative habitats* – Bull trout were more widely distributed across the John Day basin historically compared to their current distribution (Buchanan et al. 1997, pp. 69 – 72). Nevertheless they have persisted and are widely distributed within the John Day Basin. SR occurs in headwater areas in all three core areas where the habitat is still suitable and provides the primary constituent elements for bull trout.

4. *Ensure sufficient connectivity among populations* – Unlike most river basins in Oregon, there are no major dams in the John Day Basin. Seasonal barriers occur during periods of low flow

and thermal barriers occur during the summer. However, all three core areas are connected to one another through FMO. There is a potential for bull trout to migrate to the Columbia. In 2002 a bull trout was captured in the juvenile bypass facility at John Day Dam. Although its origin is unknown at this time, it could have been from the John Day River as this is the closest bull trout population upstream of the dam. The presence of a fluvial life history in all four core areas necessitates the need to protect the migratory corridors among them and to the Columbia River.

5. *Ensure sufficient habitat to support population viability (e.g., abundance, trend indices)* - Systematic surveys have been conducted since 2002, but the period of record is not sufficient to establish trends in abundance. Based on the available data, there is no clear trend in redd abundance (Service in litt. 2008f, p. 3).

6. *Consider threats (e.g., climate change)*-The John Day bull trout populations would be at increased risk of extinction with a warming of the climate because the hydrology is driven primarily by snowmelt, although some streams originate from spring fed sources. Protection of high elevation habitats will become even more important as the climate warms. Threats remain from seasonal dewatering, entrainment in irrigation ditches, removal of riparian vegetation, passage at culverts, legacy effects from forest road building, suction dredge mining in tributaries, introduced species, and illegal harvest. There are numerous restoration activities ongoing in the John Day Basin. Many are directed toward recovery of anadromous species, but these would provide benefits for bull trout because the species habitats overlap. For example, Increases in Chinook salmon have been observed due to habitat restoration in the mainstem John Day River (Service in litt. 2008f, p. 5), Restoration activities have been ongoing in three of the core areas by state, federal and local entities. Projects include the Big Boulder Creek channel relocation (MFJD), mine reclamation, riparian restoration, passage projects, and water right leases. The Nature Conservancy and the Confederated Tribes of the Warm Springs have purchased large holdings in the Middle Fork John Day core area and the CTWS has purchased land on the Upper John Day. The properties are being managed to benefit native species and restore the habitats to support them. Restoration efforts are also being pursued by Grant County Soil and Water Conservation District, and regulatory changes to benefit habitat restoration are being implemented by Grant County.

7. *Ensure sufficient redundancy in conserving population units* –The upper John Day provides high quality habitat for resident and fluvial bull trout. The entire occupied area is essential because it provides redundancy to adjacent core areas. The presence of multiple local populations distributed throughout a watershed provides a mechanism for spreading risk (Service 2002a, p. 24).

12.1. Lower Mainstem John Day River Critical Habitat Subunit

The Lower Mainstem John Day River CHSU is essential for bull trout conservation because it serves as FMO habitat and provides a vital connection between the headwaters of the John Day River basin to FMO habitat in the Columbia River. The lower mainstem John Day, from the mouth upstream to its confluence with the North Fork John Day River, is presumed occupied FMO habitat (see Appendix 1 for more detailed information).

This reach provides FMO habitat seasonally, and serves as a vital connection FMO habitat in the Columbia River. Bull trout migrations from adjacent basins, specifically the Umatilla and Deschutes rivers, to the Columbia River have been documented. Additional studies are needed

to determine bull trout FMO use in the lower mainstem John Day River. Surveys are usually conducted during the summer, and bull trout would not be expected to be in the lower mainstem at this time of the year. This unit is not a core area and thus, does not support spawning population.

The following water bodies are included in this CHSU (see Table 40):

John Day River from the confluence with the Columbia River upstream 315.7 km (163.2 mi) to its confluence with the North Fork John Day River is presumed occupied FMO habitat. Bull trout have been observed as far downstream as the town of Spray during juvenile spring Chinook sampling. Two bull trout were radio-tagged and subsequently tracked into the North Fork John Day (Hemmingsen, Gunckel, and Sankovich et al. 2001, p. 9.) Although no bull trout have been documented further downstream, their presence is probable, at least seasonally.

Table 40. Water body segments designated as critical habitat for bull trout, including documentation of occupancy and site-specific rationale in the John Day River–Lower Mainstem John Day River CHU/CHSU

CHU—CHSU	Water Body Name	State	Information Documenting Bull Trout Occupancy	Essential Habitat Rationale	LLID
John Day River– Lower Mainstem John Day River	John Day River	OR	John Day River from the confluence with the Columbia River upstream 315.7 km (163.2 mi) to its confluence with the North Fork John Day River is presumed occupied FMO habitat. Bull trout have been observed as far downstream as the town of Spray during juvenile spring Chinook sampling. Two bull trout were radio-tagged and subsequently tracked into the North Fork John Day (Hemmingsen, Gunckel, and Sankovich et al. 2001, p. 9.) Although no bull trout have been documented further downstream, their presence is probable, at least seasonally.	See CHU text	1206499 457318.1

12.2. North Fork John Day River Critical Habitat Subunit

The North Fork John Day River CHSU is essential for bull trout conservation because it provides critical spawning and rearing habitat, is connected to the mainstem John Day River FMO habitat, and has no major physical barriers (see Appendix 1 for more detailed information).

The North Fork John Day River and its tributary, the Middle Fork John Day River, flow into the mainstem John Day River with no major physical barriers between them, except for barriers as a consequence of low flow and high stream temperatures during summer that may limit the seasonal distribution of individuals. Seven local bull trout populations have been identified in the North Fork John Day River subunit: (1) the upper John Day River local population complex, including Crawfish, Baldy, Cunningham, Trail, Onion, and Crane Creeks, as well as the North Fork John Day River upstream of Granite Creek; (2) upper Granite Creek, including Bull Run, Deep, and Boundary Creeks and the upper mainstem Granite Creek; (3) Boulder Creek; (4) Clear/Lightning Creek, including Salmon Creek; (5) Clear Creek below the Pete Mann ditch, including Lightning Creek below the ditch; (6) Desolation Creek, including South Fork Desolation Creek below the falls and North Fork Desolation Creek; and (7) South Fork Desolation Creek above the falls.

The following water bodies are included in this CHSU (see Table 41):

North Fork John Day River from its confluence with the John Day River upstream 138.7 km (86.2 mi) to Granite Creek is occupied FMO habitat (Service 2002a, p. 72). From Granite Creek upstream 40.0 km (24.9 mi) to its source is known occupied spawning and rearing habitat (Buchanan et al. 1997, p. 72 – 73; Service 2002a, p. 72). Bull trout were observed during ODFW aquatic inventories in 1991 and 1993 (ODFW, *in litt.*, 1997).

West Fork Meadow Brook Creek from its confluence with the North Fork John Day River upstream 4.7 km (2.9 mi) to East Fork Meadow Brook Creek contains occupied FMO habitat.

Desolation Creek from its confluence with North Fork John Day River upstream 8.9 km (5.5 mi) is occupied FMO habitat. From this point upstream 25.1 km (15.6 mi) to the confluence of the North Fork and South Fork is occupied spawning and rearing habitat (ODFW, *in litt.*, 1997, Buchanan et al. 1997, p. 73).

South Fork Desolation Creek from its confluence with Desolation Creek upstream 14.1 km (8.8 mi) to its source contains occupied spawning and rearing habitat (ODFW, *in litt.*, 1997, Buchanan et al. 1997, p. 73).

Big Creek from the confluence with the North Fork John Day River upstream 4.1 km (2.6 mi) to the confluence with Winom Creek provides FMO habitat. Bull trout were observed during ODFW aquatic inventories in 1991 and 1995 (ODFW, *in litt.*, 1997). Surveys in 2003 and 2004 found brook trout and f2 brook trout/bull trout hybrids in Big Creek (USFS, *in litt.* 2009c).

Winom Creek from the confluence with Big Creek upstream 12.1 km (7.5 mi) to its source contains occupied spawning and rearing habitat. One bull trout was enumerated during an ODFW aquatic inventory in 1991 (ODFW, *in litt.*, 1997). Surveys in 2003 and 2004 found brook trout and f2 brook trout/bull trout hybrids in Big Creek (USFS, *in litt.* 2009c). Winom Creek has been identified as potential habitat for range expansion, but was not considered essential for recovery (Service 2002a, p. 72).

Granite Creek from the confluence with North Fork John Day River upstream 26.2 km (16.3 mi) to its source is known historic spawning and rearing habitat (prior to 1990 in Buchanan et al. 1997, p. 73). It currently provides FMO habitat for local bull trout populations in tributaries to Granite Creek. A bull trout radio tagged in the mainstem John Day River near Spray in April of 2000 was located in July 2000 at km 6.01 in Granite Creek (Hemmingsen, Gunckel, and Sankovich et al. 2001, p. 9).

Clear Creek from the confluence with the Granite Creek upstream 16.4 km (10.2 mi) to the juncture of West Fork Clear Creek contains spawning and rearing habitat. Bull trout were enumerated in Clear Creek during surveys in 1991 and 1992 (ODFW, *in litt.*, 1997).

West Fork Clear Creek from the confluence with Clear Creek upstream 3.9 km (2.4 mi) to its source provides SR habitat (ODFW, *in litt.*, 1997; Buchanan et al. 1997, p. 73; ODFW *in litt.* 2009a,b).

Bull Run Creek from the confluence with Granite Creek upstream 14.9 km (9.3 mi) to its source provides FMO habitat. There has been one sighting of a bull trout in this stream by a BLM fish biologist in 1997.

Boundary Creek from the confluence with Bull Run Creek upstream 4.1 km (2.5 mi) to its source contains spawning and rearing habitat. ODFW surveyed in 1996 (ODFW, *in litt.*, 1997) and the Wallowa-Whitman National Forest surveyed in 1990.

Deep Creek from the confluence with Bull Run Creek upstream 5.7 km (3.6 mi) to its source contains spawning and rearing habitat. ODFW surveyed in 1996 (ODFW, *in litt.*, 1997) and the Wallowa-Whitman National Forest surveyed in 1993.

Lightning Creek from the confluence with Clear Creek upstream 6.2 km (3.9 mi) to its source contains spawning and rearing habitat (ODFW, *in litt.*, 1997, Buchanan et al. 1997, p. 73).

Dry Creek from the confluence with Lightning Creek upstream 3.9 km (2.4 mi) to its source contains spawning and rearing habitat. ODFW surveyed in 1996 (ODFW, *in litt.*, 1997).

Salmon Creek from the confluence with Lightning Creek upstream 3.3 km (2.1 mi) contains spawning and rearing habitat (ODFW, *in litt.*, 1997, Buchanan et al. 1997, p. 73).

Boulder Creek from the confluence with Granite Creek upstream 8.4 km (5.2 mi) to its source provides spawning and rearing habitat (Buchanan et al. 1997, p. 73). The lower end of Boulder Creek has been altered due to mining activities and has the potential with recovery to serve as seasonal rearing habitat with overlapping FMO habitat. Spawning habitat is not present in the lower end of the reach (ODFW, *in litt.* 2009a).

Crane Creek from the confluence with North Fork John Day River upstream 6.6 km (4.1 mi) is FMO habitat. Upstream 6.4 km (3.6 mi) from the FMO habitat to the source of Crane Creek is occupied spawning and rearing habitat (ODFW, *in litt.* 2009b) Bull trout in Crane Creek were documented in 1990 during ODFW surveys (ODFW, *in litt.*, 1997).

Trail Creek from the confluence with the North Fork John Day upstream 3.0 km (1.9 mi) to the juncture with North Trail and South Trail creeks contains FMO habitat with bull trout presence documented both above and below this reach. South Trail Creek from the confluence with Trail Creek upstream 10.7 km (6.6 mi) to its source provides spawning and rearing habitat (StreamNet 2009).

South Fork Trail Creek from its confluence with Trail Creek upstream 10.7 km (6.6 mi) to its source is SR habitat (ODFW, *in litt.*, 1997, Buchanan et al. 1997, p. 73).

Onion Creek from the confluence with the North Fork John Day River upstream 7.3 km (4.5 mi) to its source is spawning and rearing habitat (Buchanan et al. 1997, p. 73).

Baldy Creek from the confluence with the North Fork John Day River upstream 8.0 km (5.0 mi), to its spring source, contains spawning and rearing habitat (ODFW, *in litt.*, 1997, Buchanan et al. 1997, p. 73).

Crawfish Creek from the confluence with North Fork John Day River upstream 8.5 km (5.3 mi) to its source provides spawning and rearing habitat (Buchanan et al. 1997, p. 73).

Cunningham Creek from the confluence with North Fork John Day upstream 2.9 km (1.8 mi) to its source contains spawning and rearing habitat (Buchanan et al. 1997, p. 73).

Table 41. Water body segments designated as critical habitat for bull trout, including documentation of occupancy and site-specific rationale in the John Day River–North Fork John Day River CHU/CHSU

CHU—CHSU	Water Body Name	State	Information Documenting Bull Trout Occupancy	Essential Habitat Rationale	LLID
John Day River–North Fork John Day River	Baldy Creek	OR	Baldy Creek from the confluence with the North Fork John Day River upstream 8.0 km (5.0 mi), to its spring source, contains spawning and rearing habitat (ODFW, <i>in litt.</i> , 1997, Buchanan et al. 1997, p. 73).	See CHU text	1183176 449098
John Day River–North Fork John Day River	Big Creek	OR	Big Creek from the confluence with the North Fork John Day River upstream 4.1 km (2.6 mi) to the confluence with Winom Creek provides FMO habitat. Bull trout were observed during ODFW aquatic inventories in 1991 and 1995 (ODFW, <i>in litt.</i> , 1997). Surveys in 2003 and 2004 found brook trout and f2 brook trout/bull trout hybrids in Big Creek (USFS, <i>in litt.</i> 2009b).	See CHU text	1186830 449604
John Day River–North Fork John Day River	Boulder Creek	OR	Boulder Creek from the confluence with Granite Creek upstream 8.4 km (5.2 mi) to its source provides spawning and rearing habitat (Buchanan et al. 1997, p. 73). The lower end of Boulder Creek has been altered due to mining activities and has the potential with recovery to serve as seasonal rearing habitat with overlapping FMO habitat. Spawning habitat is not present in the lower end of the reach (ODFW, <i>in litt.</i> 2009a).	See CHU text	1184155 448194
John Day River–North Fork John Day River	Boundary Creek	OR	Boundary Creek from the confluence with Bull Run Creek upstream 4.1 km (2.5 mi) to its source contains spawning and rearing habitat. ODFW surveyed in 1996 (ODFW, <i>in litt.</i> , 1997) and the Wallowa-Whitman National Forest surveyed in 1990.	See CHU text	1183747 447870
John Day River–North Fork John Day River	Bull Run Creek	OR	Bull Run Creek from the confluence with Granite Creek upstream 14.9 km (9.3 mi) to its source provides FMO habitat. There has been one sighting of a bull trout in this stream by a BLM fish biologist in 1997.	See CHU text	1184252 448079
John Day River–North Fork John Day River	Clear Creek	OR	Clear Creek from the confluence with the Granite Creek upstream 16.4 km (10.2 mi) to the juncture of West Fork Clear Creek contains spawning and rearing habitat. Bull trout were enumerated in Clear Creek during surveys in 1991 and 1992 (ODFW, <i>in litt.</i> , 1997).	See CHU text	1184500 448213

CHU—CHSU	Water Body Name	State	Information Documenting Bull Trout Occupancy	Essential Habitat Rationale	LLID
John Day River–North Fork John Day River	Crane Creek	OR	Crane Creek from the confluence with North Fork John Day River upstream 6.6 km (4.1 mi) is FMO habitat. Upstream 6.4 km (3.6 mi) from the FMO habitat to the source of Crane Creek is occupied spawning and rearing habitat (ODFW, <i>in litt.</i> 2009b). Bull trout in Crane Creek were documented in 1990 during ODFW surveys (ODFW, <i>in litt.</i> , 1997).	See CHU text	1184777 448936
John Day River–North Fork John Day River	Crawfish Creek	OR	Crawfish Creek from the confluence with North Fork John Day River upstream 8.5 km (5.3 mi) to its source provides spawning and rearing habitat (Buchanan et al. 1997, p. 73).	See CHU text	1182983 449150
John Day River–North Fork John Day River	Cunningham Creek	OR	Cunningham Creek from the confluence with North Fork John Day River upstream 2.9 km (1.8 mi) to its source contains spawning and rearing habitat (Buchanan et al. 1997, p. 73).	See CHU text	1182667 449108
John Day River–North Fork John Day River	Deep Creek	OR	Deep Creek from the confluence with Bull Run Creek upstream 5.7 km (3.6 mi) to its source contains spawning and rearing habitat. ODFW surveyed in 1996 (ODFW, <i>in litt.</i> , 1997) and the Wallowa-Whitman National Forest surveyed in 1993.	See CHU text	1183481 447798
John Day River–North Fork John Day River	Desolation Creek	OR	Desolation Creek from its confluence with North Fork John Day River upstream 8.9 km (5.5 mi) is occupied FMO habitat. From this point upstream 25.1 km (15.6 mi) to the confluence of the North Fork and South Fork is occupied spawning and rearing habitat (ODFW, <i>in litt.</i> , 1997, Buchanan et al. 1997, p. 73).	See CHU text	1189363 449976
John Day River–North Fork John Day River	Dry Creek	OR	Dry Creek from the confluence with Lightning Creek upstream 3.9 km (2.4 mi) to its source contains spawning and rearing habitat. ODFW surveyed in 1996 (ODFW, <i>in litt.</i> , 1997).	See CHU text	1184991 447506

CHU—CHSU	Water Body Name	State	Information Documenting Bull Trout Occupancy	Essential Habitat Rationale	LLID
John Day River–North Fork John Day River	Granite Creek	OR	Granite Creek from the confluence with North Fork John Day River upstream 26.2 km (16.3 mi) to its source is known historic spawning and rearing habitat (prior to 1990 in Buchanan et al. 1997, p. 73). It currently provides FMO habitat for local bull trout populations in tributaries to Granite Creek. A bull trout radio tagged in the mainstem John Day River near Spray in April of 2000 was located in July 2000 at km 6.01 in Granite Creek (Hemmingsen, Gunckel, and Sankovich et al. 2001, p. 9).	See CHU text	1185615 448659
John Day River–North Fork John Day River	Lightning Creek	OR	Lightning Creek from the confluence with Clear Creek upstream 6.2 km (3.9 mi) to its source contains spawning and rearing habitat (ODFW, in litt., 1997, Buchanan et al. 1997, p. 73).	See CHU text	1184968 447647
John Day River–North Fork John Day River	North Fork John Day River	OR	North Fork John Day River from its confluence with the John Day River upstream 138.7 km (86.2 mi) to Granite Creek is occupied FMO habitat (Service 2002a, p. 72). From Granite Creek upstream 40.0 km (24.9 mi) to its source is known occupied spawning and rearing habitat (Buchanan et al. 1997, p. 72 – 73; Service 2002a, p. 72). Bull trout were observed during ODFW aquatic inventories in 1991 and 1993 (ODFW, in litt., 1997).	See CHU text	1196393 447553
John Day River–North Fork John Day River	Onion Creek	OR	Onion Creek from the confluence with the North Fork John Day River upstream 7.3 km (4.5 mi) to its source is spawning and rearing habitat (Buchanan et al. 1997, p. 73).	See CHU text	1184006 449127
John Day River–North Fork John Day River	Salmon Creek	OR	Salmon Creek from the confluence with Lightning Creek upstream 3.3 km (2.1 mi) contains spawning and rearing habitat (ODFW, in litt., 1997, Buchanan et al. 1997, p. 73).	See CHU text	1185028 447252
John Day River–North Fork John Day River	South Fork Desolation Creek	OR	South Fork Desolation Creek from its confluence with Desolation Creek upstream 14.1 km (8.8 mi) to its source contains occupied spawning and rearing habitat (ODFW, in litt., 1997, Buchanan et al. 1997, p. 73).	See CHU text	1186888 448196
John Day River–North Fork John Day River	South Trail Creek	OR	South Fork Trail Creek from its confluence with Trail Creek upstream 10.7 km (6.6 mi) to its source is SR habitat (ODFW, in litt., 1997, Buchanan et al. 1997, p. 73).	See CHU text	1183896 449368

CHU—CHSU	Water Body Name	State	Information Documenting Bull Trout Occupancy	Essential Habitat Rationale	LLID
John Day River– North Fork John Day River	Trail Creek	OR	Trail Creek from the confluence with the North Fork John Day upstream 3.0 km (1.9 mi) to the juncture with North Trail and South Trail creeks contains FMO habitat with bull trout presence documented both above and below this reach. South Trail Creek from the confluence with Trail Creek upstream 10.7 km (6.6 mi) to its source provides spawning and rearing habitat (StreamNet 2009).	See CHU text	1184063 449155
John Day River– North Fork John Day River	West Fork Clear Creek	OR	West Fork Clear Creek from the confluence with Clear Creek upstream 3.9 km (2.4 mi) to its source provides SR habitat (ODFW, in litt., 1997; Buchanan et al. 1997; p. 73; ODFW in litt. 2009a,b).	See CHU text	1185450 447490
John Day River– North Fork John Day River	West Fork Meadow Brook Creek	OR	West Fork Meadow Brook Creek from its confluence with the North Fork John Day River upstream 4.7 km (2.9 mi) to East Fork Meadow Brook Creek contains occupied FMO habitat.	See CHU text	1189455 449975
John Day River– North Fork John Day River	Winom Creek	OR	Winom Creek from the confluence with Big Creek upstream 12.1 km (7.5 mi) to its source contains occupied spawning and rearing habitat. One bull trout was enumerated during an ODFW aquatic inventory in 1991 (ODFW, in litt., 1997). Surveys in 2003 and 2004 found brook trout and f2 brook trout/bull trout hybrids in Big Creek (USFS, in litt, 2009b). Winom Creek has been identified as potential habitat for range expansion, but was not considered essential for recovery (Service 2002a, p. 72).	See CHU text	1186718 449764

12.3. Middle Fork John Day River Critical Habitat Subunit

The Middle Fork John Day River CHSU is essential for bull trout conservation because it provides critical spawning and rearing habitat, is connected to the mainstem John Day River FMO habitat, and has no major physical barriers (see Appendix 1 for more detailed information).

Three local populations exist within the Middle Fork John Day River subunit drainage: Clear Creek, Granite Boulder Creek, and Big Creek. Two creeks, Butte and Vinegar, were identified as potential bull trout habitat and may contain local populations based on limited data. Additional surveys are necessary to confirm the presence of bull trout populations.

The following water bodies are included in this CHSU (see Table 42):

Middle Fork John Day River from the confluence with the North Fork John Day River upstream 105.8 km (65.7 mi) to its source is FMO habitat.

Clear Creek from the confluence with the Middle Fork John Day River upstream 20.4 km (12.7 mi) to its source is occupied spawning and rearing habitat (Buchanan et al. 1997, pp. 72-73; Moore et al. 2006, p. 24 – 25).

Granite Boulder Creek from the confluence with the Middle Fork John Day River upstream 13.0 km (8.1 mi) to a barrier falls is occupied spawning and rearing habitat (Buchanan et al. 1997, p. 73; Claire and Gray 1993, no pagination). One bull trout redd was enumerated during ODFW surveys in 2005 (Moore et al. 2006, p. 24).

Big Creek from the confluence with the Middle Fork John Day River upstream 18.6 km (11.6 mi) to its source is occupied spawning and rearing habitat (Buchanan et al. 1997, p. 73; Claire and Gray 1993, no pagination). A single bull trout was documented during ODFW surveys in 1995 (ODFW, *in litt.*, 1997), and one redd was enumerated during ODFW surveys in 2005 (Moore et al. 2006, p. 24 - 25). During surveys in Big Creek in 1999, the population was estimated at 1950 fish mostly juveniles and subadults (Hemmingsen 1999, no pagination). Interchange between the other spawning habitats in the Middle Fork John Day is unknown, but suspected to be limited by habitat alterations and thermal barriers during the summer (Claire and Gray 1993, no pagination).

Deadwood Creek from the confluence with Big Creek upstream approximately 7.2 km (4.5 mi) is occupied spawning and rearing habitat (Buchanan et al. 1997, p. 73).

Population surveys conducted by the ODFW affirmed the presence of bull trout (Hemmingsen 1999, no pagination). However in 2005, no bull trout redds were observed during ODFW surveys (Moore et al. 2006, p. 24 - 25).

Butte Creek from the confluence with the Middle Fork John Day River upstream 7.8 km (4.9 mi) to the headwaters provides spawning and rearing habitat for bull trout. Juvenile bull trout were identified in Butte Creek during a culvert removal in 2007; additional surveys are needed to confirm the presence of a spawning population (Service *in litt.* 2008e).

Vinegar Creek from the confluence with the Middle Fork John Day River upstream 15.2 km (9.4 mi) to its source provides spawning and rearing habitat for bull trout. Isolated sightings of bull trout have been confirmed in Vinegar Creek, and the Bull Trout Draft Recovery Plan identifies Vinegar Creek as potential habitat for bull trout (Seals, *in litt.* 2000, no pagination),

and the draft recovery plan identifies Vinegar Creek as potential habitat for bull trout (Service 2002a, p. 18).

Table 42. Water body segments designated as critical habitat for bull trout, including documentation of occupancy and site-specific rationale in the John Day River–Middle Fork John Day River CHU/CHSU

CHU—CHSU	Water Body Name	State	Information Documenting Bull Trout Occupancy	Essential Habitat Rationale	LLID
John Day River–Middle Fork John Day River	Big Creek	OR	Big Creek from the confluence with the Middle Fork John Day River upstream 18.6 km (11.6 mi) to its source is occupied spawning and rearing habitat (Buchanan et al. 1997, p. 73; Claire and Gray 1993, no pagination). A single bull trout was documented during ODFW surveys in 1995 (ODFW, in litt., 1997), and one redd was enumerated during ODFW surveys in 2005 (Moore et al. 2006, p. 24 - 25). During surveys in Big Creek in 1999, the population was estimated at 1950 fish mostly juveniles and subadults (Hemmingsen 1999, no pagination). Interchange between the other spawning habitats in the Middle Fork John Day is unknown, but suspected to be limited by habitat alterations and thermal barriers during the summer (Claire and Gray 1993, no pagination).	See CHU text	1188742 447658
John Day River–Middle Fork John Day River	Butte Creek	OR	Butte Creek from the confluence with the Middle Fork John Day River upstream 7.8 km (4.9 mi) to the headwaters provides spawning and rearing habitat for bull trout. Juvenile bull trout were identified in Butte Creek during a culvert removal in 2007; additional surveys are needed to confirm the presence of a spawning population (Service in litt. 2008e).	See CHU text	1186523 446422
John Day River–Middle Fork John Day River	Clear Creek	OR	Clear Creek from the confluence with the Middle Fork John Day River upstream 20.4 km (12.7 mi) to its source is occupied spawning and rearing habitat (Buchanan et al. 1997, pp. 72-73; Moore et al. 2006, p. 24 – 25).	See CHU text	1185080 445935
John Day River–Middle Fork John Day River	Deadwood Creek	OR	Deadwood Creek from the confluence with Big Creek upstream approximately 7.2 km (4.5 mi) is occupied spawning and rearing habitat (Buchanan et al. 1997, p. 73). Population surveys conducted by the ODFW affirmed the presence of bull trout (Hemmingsen 1999, no pagination). However in 2005, no bull trout redds were observed during ODFW surveys (Moore et al. 2006, p. 24 - 25).	See CHU text	1187927 447678

CHU—CHSU	Water Body Name	State	Information Documenting Bull Trout Occupancy	Essential Habitat Rationale	LLID
John Day River– Middle Fork John Day River	Granite Boulder Creek	OR	Granite Boulder Creek from the confluence with the Middle Fork John Day River upstream 13.0 km (8.1 mi) to a barrier falls is occupied spawning and rearing habitat (Buchanan et al. 1997, p. 73; Claire and Gray 1993, no pagination). One bull trout redd was enumerated during ODFW surveys in 2005 (Moore et al. 2006, p. 24).	See CHU text	1186651 446474
John Day River– Middle Fork John Day River	Middle Fork John Day River	OR	Middle Fork John Day River from the confluence with the North Fork John Day River upstream 105.8 km (65.7 mi) to its source is FMO habitat.	See CHU text	1193015 449167.1
John Day River– Middle Fork John Day River	Vinegar Creek	OR	Vinegar Creek from the confluence with the Middle Fork John Day River upstream 15.2 km (9.4 mi) to its source provides spawning and rearing habitat for bull trout. Isolated sightings of bull trout have been confirmed in Vinegar Creek, and the Bull Trout Draft Recovery Plan identifies Vinegar Creek as potential habitat for bull trout (Seals, in litt. 2000, no pagination), and the draft recovery plan identifies Vinegar Creek as potential habitat for bull trout (Service 2002a, p. 18).	See CHU text	1185357 446012

12.4. Upper Mainstem John Day River Critical Habitat Subunit

The Upper Mainstem John Day River CHSU is essential for bull trout conservation because it provides critical spawning and rearing habitat, is connected to the mainstem John Day River FMO habitat, and has no major physical barriers (see Appendix 1 for more detailed information).

There are two local populations identified in the upper mainstem John Day River, the upper John Day River local population complex that includes Deardorff Creek, Reynolds Creek, Rail Creek, Roberts Creek, and Call Creek and the Indian Creek local population. The upper John Day River local population occurs in the headwaters streams of the John Day River. Indian Creek enters the John Day west of Prairie City.

The following water bodies are included in this CHSU (see Table 43):

John Day River from the confluence with the North Fork John Day River upstream 133.9 km (83.2 mi) to the confluence with Reynolds Creek is occupied FMO habitat. From Reynolds Creek upstream 20.7 km (12.9 mi) to its source is occupied spawning and rearing habitat. Presence of bull trout has been confirmed in the mainstem John Day downstream to Sheep Rock (near the JD Fossil bed visitor center) (Service in litt. 2008f, p. 4). Bull trout were observed in the upper mainstem John Day River during ODFW aquatic inventories in 1990 (ODFW, *in litt.*, 1997) and tissue samples were taken in 1995 for genetic analysis (Hemmingsen et al. 1996, pp. 2 and 7).

Indian Creek from its confluence with the John Day River upstream 19.0 km (11.8 mi) to the headwaters provides SR habitat for bull trout. Bull trout spawning occurs above a seasonal flow barrier. Restoring functional connectivity in Indian Creek is a priority for recovery because this population is essential to the long-term conservation of the species (Service 2002a, p. 53) although distribution is seasonally limited by low flows (Service in litt. 2008f, p. 5). Surveys conducted in 1992 detected bull trout in Indian Creek (Claire and Gray 1993, Appendix Table A, no pagination) and tissue samples were taken in 1995 for genetic analysis (Hemmingsen et al. 1996, pp. 2 and 7). A large fire in the Indian Creek watershed in 1996 may have altered habitat, thereby impacting the local population (Service 2002a, pp.30 and 110). Additional surveys for presence have not been conducted. Irrigation diversions from the mouth upstream to the Forest Service boundary alter the habitat during the irrigation season, so it is useful as FMO habitat for the non-irrigation part of the year (approximately October through May) (ODFW, *in litt.*, 2000a). Known bull trout SR habitat occurs upstream of the Forest Service/Wilderness boundary (Buchanan et al. 1997, p. 73).

Reynolds Creek from its confluence with the John Day River upstream 15.5 km (9.6 mi) to its source is known occupied spawning and rearing habitat (Buchanan et al. 1997, p. 73). Bull trout were observed during ODFW aquatic inventories in 1990 (ODFW, *in litt.*, 1997), and tissue samples were taken in 1995 for genetic analysis (Hemmingsen et al. 1996, pp. 2 and 7). Bull trout in Reynolds Creek were captured and radio tagged in 1999 for tracking studies conducted from 1997 through 2000 (Hemmingsen, Gunckel, and Sankovich et al. 2001, p. 6–11).

North Fork Reynolds Creek from its confluence with Reynolds Creek upstream 11.9 km (7.4 mi) is occupied SR habitat (Buchanan et al. 1997, p. 73). Bull trout were observed during ODFW aquatic inventories in 1990 and 1997 (ODFW, *in litt.*, 1997).

Deardorff Creek from its confluence with the John Day River upstream 15.5 km (9.6 mi) to its source is known occupied SR habitat (Buchanan et al. 1997, pp. 72 – 73). Bull trout were

observed during ODFW aquatic inventories in 1990 and 1997 (ODFW, *in litt.*, 1997), and tissue samples were taken in 1995 for genetic analysis (Hemmingsen et al. 1996, pp. 2 and 7). Bull trout in Deardorff Creek were captured and radio tagged in 1997 for tracking studies conducted from 1997 through 2000 (Hemmingsen, Bellerud, Buchanan, et al. 2001, pp. 9-12; 2001b, p. 13; 2001c, p. 14; and 2001d, pp. 10 - 11).

Rail Creek from its confluence with the John Day upstream 11.4 km (7.1 mi) to its source is occupied SR habitat (Buchanan et al. 1997, pp. 72 - 73). Bull trout were observed during ODFW aquatic inventories in 1990 (ODFW, *in litt.*, 1997).

Roberts Creek from its confluence with the John Day River upstream 8.9 km (5.5 mi) to its source is occupied SR habitat (Buchanan et al. 1997, pp. 72 – 73). Bull trout were observed during ODFW aquatic inventories in 1996 and 1997 (ODFW, *in litt.*, 1997), and tissue samples were taken in 1995 for genetic analysis (Hemmingsen et al. 1996, pp. 2 and 7). Bull trout in Roberts Creek were captured and radio tagged in 1997 for tracking studies conducted from 1997 through 2000 (Hemmingsen, Bellerud, Buchanan, et al. 2001, pp. 9-12; Hemmingsen, Bellerud, Gunkel, et al. 2001, p. 13; Hemmingsen, Gunckel, and Howell, 2001, pp. 6–13; and Hemmingsen, Gunckel, Sankovich, et al. 2001, pp. 10–11).

Call Creek from its confluence with the John Day River upstream 6.1 km (3.8 mi) to its source is occupied SR habitat (Buchanan et al. 1997, pp. 72 – 73). Bull trout were observed during ODFW aquatic inventories in 1990 (ODFW, *in litt.*, 1997) and tissue samples were taken in 1995 for genetic analysis (Hemmingsen et al. 1996, pp. 2 and 7). Bull trout in Call Creek were captured and radio tagged in 1997 for tracking studies conducted from 1997 through 2000 (Hemmingsen, Bellerud, Buchanan, et al. 2001, pp. 9-10; Hemmingsen, Bellerud, Gunkel, et al. 2001, p. 13; Hemmingsen, Gunckel, and Howell, 2001, pp. 6 – 13; and Hemmingsen, Gunckel, Sankovich, et al. 2001, pp. 10-11).

Table 43. Water body segments designated as critical habitat for bull trout, including documentation of occupancy and site-specific rationale in the John Day River–Upper Mainstem John Day River CHU/CHSU

CHU—CHSU	Water Body Name	State	Information Documenting Bull Trout Occupancy	Essential Habitat Rationale	LLID
John Day River–Upper Mainstem John Day River	Call Creek	OR	Call Creek from its confluence with the John Day River upstream 6.1 km (3.8 mi) to its source is occupied SR habitat (Buchanan et al. 1997, pp. 72 – 73). Bull trout were observed during ODFW aquatic inventories in 1990 (ODFW, in litt., 1997) and tissue samples were taken in 1995 for genetic analysis (Hemmingsen et al. 1996, pp. 2 and 7). Bull trout in Call Creek were captured and radio tagged in 1997 for tracking studies conducted from 1997 through 2000 (Hemmingsen, Bellerud, Buchanan, et al. 2001, pp. 9-10; Hemmingsen, Bellerud, Gunkel, et al. 2001, p. 13; Hemmingsen, Gunkel, and Howell, 2001, pp. 6 – 13; and Hemmingsen, Gunkel, Sankovich, et al. 2001, pp. 10-11)..	See CHU text	1185571 443201
John Day River–Upper Mainstem John Day River	Deardorff Creek	OR	Deardorff Creek from its confluence with the John Day River upstream 15.5 km (9.6 mi) to its source is known occupied SR habitat (Buchanan et al. 1997, pp. 72 – 73). Bull trout were observed during ODFW aquatic inventories in 1990 and 1997 (ODFW, in litt., 1997), and tissue samples were taken in 1995 for genetic analysis (Hemmingsen et al. 1996, pp. 2 and 7). Bull trout in Deardorff Creek were captured and radio tagged in 1997 for tracking studies conducted from 1997 through 2000 (Hemmingsen, Bellerud, Buchanan, et al. 2001, pp. 9-12; Hemmingsen, Bellerud, Gunkel, et al. 2001, p. 13; Hemmingsen, Gunkel, and Howell, 2001, pp. 6 – 13; and Hemmingsen, Gunkel, Sankovich, et al. 2001, pp. 10-11).	See CHU text	1185763 443948

CHU—CHSU	Water Body Name	State	Information Documenting Bull Trout Occupancy	Essential Habitat Rationale	LLID
John Day River—Upper Mainstem John Day River	Indian Creek	OR	Indian Creek from its confluence with the John Day River upstream 19.0 km (11.8 mi) to the headwaters provides SR habitat for bull trout. Bull trout spawning occurs above a seasonal flow barrier. Restoring functional connectivity in Indian Creek is a priority for recovery because this population is essential to the long-term conservation of the species (Service 2002a, p. 53) although distribution is seasonally limited by low flows (Service in litt. 2008f, p. 5). Surveys conducted in 1992 detected bull trout in Indian Creek (Claire and Gray 1993, Appendix Table A, no pagination) and tissue samples were taken in 1995 for genetic analysis (Hemmingsen et al. 1996, pp. 2 and 7). A large fire in the Indian Creek watershed in 1996 may have altered habitat, thereby impacting the local population (Service 2002a, pp.30 and 110). Additional surveys for presence have not been conducted. Irrigation diversions from the mouth upstream to the Forest Service boundary alter the habitat during the irrigation season, so it is useful as FMO habitat for the non-irrigation part of the year (approximately October through May) (ODFW, in litt., 2000a). Known bull trout SR habitat occurs upstream of the Forest Service/Wilderness boundary (Buchanan et al. 1997, p. 73).	See CHU text	1188002 444428
John Day River—Upper Mainstem John Day River	John Day River	OR	John Day River from the confluence with the North Fork John Day River upstream 133.9 km (83.2 mi) to the confluence with Reynolds Creek is occupied FMO habitat. From Reynolds Creek upstream 20.7 km (12.9 mi) to its source is occupied spawning and rearing habitat. Presence of bull trout has been confirmed in the mainstem John Day downstream to Sheep Rock (near the JD Fossil bed visitor center) (Service in litt. 2008f, p. 4). Bull trout were observed in the upper mainstem John Day River during ODFW aquatic inventories in 1990 (ODFW, in litt., 1997) and tissue samples were taken in 1995 for genetic analysis (Hemmingsen et al. 1996, pp. 2 and 7).	See CHU text	1206499 457318
John Day River—Upper Mainstem John Day River	North Reynolds Creek	OR	North Fork Reynolds Creek from its confluence with Reynolds Creek upstream 11.9 km (7.4 mi) is occupied SR habitat (Buchanan et al. 1997, p. 73). Bull trout were observed during ODFW aquatic inventories in 1990 and 1997 (ODFW, in litt., 1997).	See CHU text	1185168 444229

CHU—CHSU	Water Body Name	State	Information Documenting Bull Trout Occupancy	Essential Habitat Rationale	LLID
John Day River— Upper Mainstem John Day River	Rail Creek	OR	Rail Creek from its confluence with the John Day River upstream 11.4 km (7.1 mi) to its source is occupied SR habitat (Buchanan et al. 1997, pp. 72 - 73). Bull trout were observed during ODFW aquatic inventories in 1990 (ODFW, in litt., 1997).	See CHU text	1185745 443489
John Day River— Upper Mainstem John Day River	Reynolds Creek	OR	Reynolds Creek from its confluence with the John Day River upstream 15.5 km (9.6 mi) to its source is known occupied spawning and rearing habitat (Buchanan et al. 1997, p. 73). Bull trout were observed during ODFW aquatic inventories in 1990 (ODFW, in litt., 1997), and tissue samples were taken in 1995 for genetic analysis (Hemmingsen et al. 1996, pp. 2 and 7). Bull trout in Reynolds Creek were captured and radio tagged in 1999 for tracking studies conducted from 1997 through 2000 (Hemmingsen, Gunckel, Sankovich, et al. 2001, p. 6 - 11).	See CHU text	1185958 444143
John Day River— Upper Mainstem John Day River	Roberts Creek	OR	Roberts Creek from its confluence with the John Day River upstream 8.9 km (5.5 mi) to its source is occupied SR habitat (Buchanan et al. 1997, pp. 72 – 73). Bull trout were observed during ODFW aquatic inventories in 1996 and 1997 (ODFW, in litt., 1997), and tissue samples were taken in 1995 for genetic analysis (Hemmingsen et al. 1996, pp. 2 and 7). Bull trout in Roberts Creek were captured and radio tagged in 1997 for tracking studies conducted from 1997 through 2000 (Hemmingsen Bellerud, Buchanan, et al. 2001, Hemmingsen, Bellerud, Gunkel, et al. 2001, p. 13; Hemmingsen, Gunckel, and Howell, 2001, pp. 6 – 13; and Hemmingsen, Gunckel, Sankovich, et al. 2001, pp. 10-11).	See CHU text	1185747 443478